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Feasibility study of terahertz time-domain measurement to monitor individual layer thickness of bilayer tablets

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ABSTRACT

Individual layer weight control is a critical issue for bilayer tablets during manufacturing process. Despite its importance for ensuring product content uniformity, few studies have investigated the possibility of developing a process analytical technology (PAT) tool to monitor the individual layer control. We introduced the use of Terahertz time-domain measurement because of its fast measurement to be inline/online. Its feasibility was then investigated to measure individual layer thickness for bilayer tablets. The design of experiment included API concentration, excipient type, and layer weight ratio. Tablets were scanned in Terahertz region and refractive index was measured. The predicted values from the measurement were compared to the reference. This study has shown that successful measurements are statistically consistent with the reference for each individual layer and accuracy can be even higher if measurements were taken both sides. Measurement failure scenario is also presented. Based on results, the potential possibility for Terahertz time-domain measurement to be a PAT tool for bilayer tablets is discussed.